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July 12th, 1996

Mr. William Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

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Re : ET Docket No 96-8

Dear Mr. Caton:

Transmitted herewith are an original and nine (9) copies of the Reply Comments of Western Multiplex Corporation in response to the above Notice of Proposed Rulemaking by the Commission released on February 5th 1996.

Please address any questions concerning this matter directly to the undersigned.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'Graham Barnes', is written over a horizontal line.

Graham Barnes
Director of Marketing

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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FCC 96-36

In the Matter of)	
)	
Amendment of Parts 2 and 15 of the)	ET Docket No. 96-8
Commission's Rules Regarding Spread)	RM-8435, RM-8608, RM-8609
Spectrum Transmitters)	

Adopted: January 30, 1996

Released: February 5, 1996

REPLY COMMENTS OF WESTERN MULTIPLEX

Western Multiplex Corporation (WMC), pursuant to Section 1.415 of the Commission's rules, hereby submits these reply comments on the above referenced Notice of Proposed Rule Making. WMC is a major supplier of Part 15 radios operating in the 2450 MHz and 5800 MHz ISM bands with spread spectrum technology. WMC has many years of experience and considerable practical knowledge of the market's needs for these products. WMC has successfully designed, manufactured and marketed Part 15 spread spectrum radios and developed extensive technical experience in the operation of communications systems in the unlicensed ISM environment which require co-existence with a wide variety of unlicensed equipment manufactured by others as well as other emissions generated by non-communications equipment using the ISM bands. WMC is also a member of the Part 15 Coalition and is in general agreement with the comments submitted by the Part 15 Coalition on this NPRM. WMC is submitting these reply comments to draw attention to the general level of WMC support from

SUMMARY

Over the last several years, thousands of 2450 and 5800 MHz ISM band spread spectrum radios with transmitter output powers of 1 Watt have been deployed using directional, high-gain antennas. These systems have been shown to serve the public interest and to operate on a non-interference basis with existing licensed and unlicensed communications.

Western Multiplex Corporation (WMC) and several other NPRM responding parties have presented compelling evidence that these systems do not increase opportunity for interference and that they do serve the public interest. None of the responding parties have submitted any compelling evidence to the contrary. The Commission's NPRM and many of the responding parties comments mention "concern" and "belief" that these systems "could" pose a problem, but none of these are substantiated by application, calculation or demonstration in any of the submitted comments. WMC's field experience of over 65 million hours of fielded use of these systems, with no reports of interference, combined with the empirical calculations which were presented in our response to the NPRM provide the Commission with compelling evidence that there is little or no concern with respect to unmanageable interference. This view is shared by a vast majority of the responding parties.

The Commission has also proposed additional legislation concerning the use of directional antennas, and many parties have responded to these proposals. Again, the responding parties which support these additional proposals have provided no compelling evidence that these proposals are necessary. WMC believes that these proposed regulations are unnecessary, as current rules regarding non-interference and health/safety are sufficient and working well. Our practical experience indicates that this additional legislation is unnecessary.

A. REQUEST TO INCLUDE ADVANCED SUPPORT FOR WMC POSITION

WMC has received strong support for our position on this NPRM from many branches of the community. It has come to our attention that several comment letters were received by the Commission slightly prior to the start of the comment period. WMC respectfully requests that these comment letters be included in the NPRM proceedings and for consideration by the Commission. According to our records, seven (7) advanced comment letters were sent to the Commission completely supporting WMC's position on the NPRM. In addition to these eight letters, two (2) additional letters were sent during the approved comment period. These nine letters were sent by the following list of organizations and companies:

- Gabriel Electronics
- Ocom Corporation
- North Alabama Cellular/Oneonta Telephone
- Questar Infocom
- Sola Communications
- United States Cellular
- U. S. West New Vector
- AT&T Wireless
- Rural Cellular Corporation

We have included these companies in the statistics presented in these reply comments, referring to this group as "WMC advanced supporters."

B. REMOVE EIRP LIMITS IN BOTH THE 2450 AND 5800 MHz BANDS

22 out of the 22 responding parties (including WMC advanced supporters) that had comments on the removal of EIRP limits support the removal of EIRP limits in the 5800 MHz band. 17 out of these 22 also support the removal of EIRP limits in the 2450 MHz band, including the Part 15 Coalition (which represents a large group of companies). These responding

parties have presented that the use of directional antennas is desirable and has and will continue to improve frequency re-use and decrease opportunity for interference. Also, many responding parties made note of the impact of non communications ISM equipment (Part 18) on these bands and the necessity to overcome background radiation for ISM communications equipment. Many of the responding parties have also made mention of the public interest in maintaining the availability of these systems including their use for emergency applications. Clearly it is in the public interest to remove the EIRP limits in these bands.

The only opposition for EIRP limit removal has been in the 2450 MHz band. However, there has been no evidence presented by any opposing party that point-to-point systems which use high-gain directional antennas pose increased opportunity for interference beyond that which is anticipated for systems operating within the current EIRP limits using omnidirectional antennas. To the contrary, it has been presented by several parties that the omnidirectional systems will typically cause interference into point-to-point systems before the point-to-point systems will interfere with them. This is due to the nature of the antenna radiation patterns (both transmit and receive) and the relative distances of the two types of systems.

Adtran, Cushcraft, Digital Wireless, Rockwell and the Telecommunications Industry Association (TIA) each support elimination of limits in the 5800 MHz band but not the 2450 MHz band. None of these responding parties provides practical application experience or mathematical models to support their position for not eliminating EIRP limits at 2450 MHz. In fact, most of these parties do not explain why they have concern in the 2450 MHz band. In most cases, they cite their "beliefs" and "concerns" that point-to-point systems "might" present increased interference, but these are not supported by any evidence, practical or otherwise. Also, none of these parties address the Part 18 background radiation issues with respect to this band.

Apple Computer, American Petroleum Institute (API), Cylink, Metricom, Microwave Communications Technology Inc. (MCT), Microwave Data Systems (MDS), the Part 15 Coalition and the WMC advanced supporters agree with WMC regarding the removal of EIRP limits in the 2450 MHz band on the basis of the qualities of directional antennas (narrow beamwidths) and the resulting frequency re-use when used with these antennas. Most of these parties also cite that systems using omnidirectional antennas are more likely to interfere with point-to-point systems employing directional antennas than in the reverse.

API, Cylink, Metricom, MDS and the Part 15 Coalition also cite direct application experience using these systems without any reports of interference. It is well noted that these systems have been in operation for several years using directional antennas without EIRP restriction.

Apple Computer, Cylink, Metricom, MCT and the Part 15 Coalition also refer to concern over wideband ISM RF noise sources (Part 18 devices) being the dominant source of RF energy in the 2450 MHz band. The lifting of EIRP restrictions and the use of directional antennas would benefit the use of communication systems in this band. In fact, the submission by Fusion Systems supports this understanding with evidence of practical experience of their fielded Part 18 systems.

Metricom and the Part 15 Coalition also correctly point out that the technology applied for spread spectrum systems is designed to operate under conditions of interference. As a result, normal concerns over interference for typical communication systems do not apply in this band as the devices are designed to perform in a crowded RF environment. This concept supports the removal of EIRP limits in the 2450 MHz band.

WMC supports the API proposal to change the rules to allow users to compensate for transmission line losses for their system implementations (Paragraph 3 of their comments) with 1 Watt maximum input to the antenna. API makes a good argument for a change to the rules to be related to the output power into the antenna and not out of the device, as many installations may require long transmission line runs, and system performance should not be penalized for the physical limitations of the site. As users are already able to deploy these systems directly next to antennas (with little or no transmission line loss), this rule change would have no real effect on the spectrum but could be very beneficial for system integrators.

C. DO NOT UNNECESSARILY REGULATE SYSTEM IMPLEMENTATION

Several additional regulations have been proposed by the Commission:

- Reduction in output power of 1 dB for each 3 dB that antenna gain exceeds 6 dBi;
- Limits on horizontal and vertical beamwidths;
- Radiation warnings and/or proximity sensors; and
- Limitations for cross-border transmissions

Several responding parties, including WMC advanced supporters, endorse the WMC claim that all of these regulations impose unnecessary system requirements which add cost and complexity to systems and may degrade performance. The parties who have supported these proposed regulations in their comments have not provided any reasons for why they support them or any reasons for why these regulations should exist at all

Regarding the “3-for-1” rule, responding parties have demonstrated that (without this rule in effect) these systems do not pose a threat to other systems. This proposed rule almost completely counteracts the removal of EIRP limits, for which there is strong evidence and support. In addition, with this rule in place, larger (and more expensive) antennas will have a

diminishing benefit for system distances and will reduce the applications for these products as well as complicating the installation of these systems. It is in the Commission's and the public interest to use larger antennas wherever possible, thus reducing the opportunity for interference and increasing frequency re-use. Based on the applications of these systems over the past several years by several manufacturers, this proposed rule does not support the public interest. Responding parties who supported the proposal for this regulation have provided no specific evidence that it is necessary

Regarding limits on horizontal and vertical beamwidths, it is shared by many responding parties that this is unnecessary to regulate as this is readily accomplished with typical commercially available antennas. Cushcraft (an antenna manufacturer) agrees with WMC that the vast majority of commercially available antennas already meet this requirement and do not require further regulation.

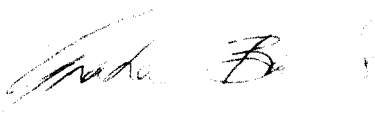
Regarding antenna exposure warning it is clear by the responding parties that no drastic measures (such as proximity sensors) need to be taken. It is also clear that there is no reasonable concern regarding excessive exposure primarily due to the relatively low power outputs over a large area and the likelihood of the proximity of humans to these antennas. Even those companies which said that a warning label would be acceptable have also stated that harmful exposure from these systems is extremely unlikely. WMC reminds the Commission that high output powers are allowed for licensed operations and no such labeling regulations apply for these systems, therefore it seems unreasonable to apply them for Part 15.247 systems. Also, WMC calls attention to Attachment 2 of our NPRM response which compares the relative dangers of exposure between a point-to-point system and a typical hand-held cordless phone.

Addressing cross-border transmissions, not very many responding parties commented. WMC, our supporters and the Part 15 coalition agree that this proposed regulation is unnecessary.

CONCLUSION

WMC recognizes the overall support for elimination of EIRP limits in the 5800 MHz band in the comments to this proceeding and applauds the community and the Commission for recognition of this important change to the current rules. WMC also recognizes that a majority of responding parties support the removal of EIRP limits in the 2450 MHz band with substantial evidence supporting that this rule change will not impose significant interference. The Commission should note that, for the most part, the parties which do not support WMC's positions in modifying the Commission's proposal have not presented evidence supporting their belief that these elements of the Commission's proposal are necessary. These parties may not have fully considered the issues associated with these positions and the need for these changes. It would appear that these parties simply accepted the Commission's proposal, without considering alternatives. Many elements of the NPRM propose unnecessary regulation for unlicensed systems. WMC respectfully requests careful consideration of our reply comments.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Graham Barnes", is written over a light blue horizontal line.

Graham Barnes
Director of Marketing
Western Multiplex Corporation.